

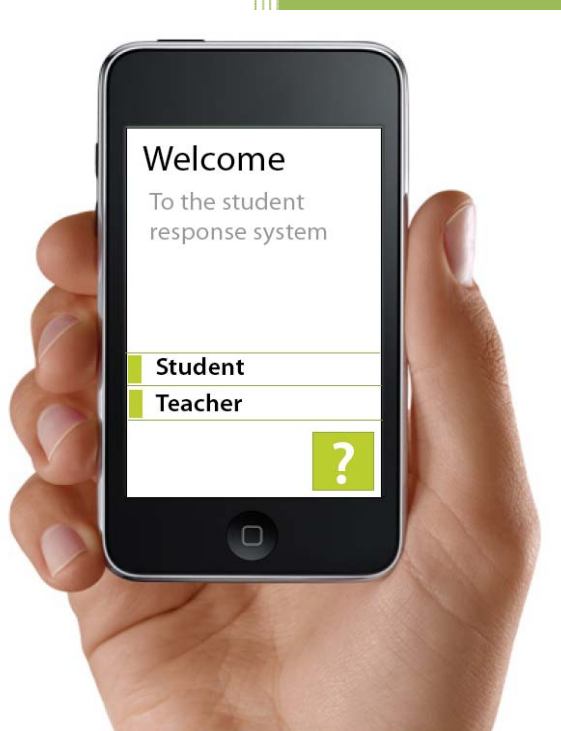


Education and Culture DG

Lifelong Learning Programme

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SRS user manual



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Introduction

As part of the Edumecca project, a new type of student response system (SRS) for next-generation handheld devices (such as iPod Touch or iPhone) is to be developed.

At college or university level, classes are quite large (more than 60 students per class). Due to time constraints, it's often not possible for the lecturer to interact directly with the students during the lecture. Furthermore, many students find it difficult or embarrassing to ask questions in class; which reduces the level of student-teacher interaction even further.

Because of the lack of feedback during class, it's difficult for the lecturer to assess how many of the students actually follow and understand what's being taught. Conversely, from the students' perspective, their understanding of the material is rarely put to the test during class - such tests usually take the form of written assignments and exercises which are corrected and returned weeks later. In other words, neither the teacher nor the students have a good "real-time" indicator of learning effect.

Again, because of time constraints, the students are rarely given time to discuss and interact with each other during class. If a student finds it hard to understand what's being taught in class, it is therefore difficult to gauge whether he or she is the only one who doesn't follow the proceedings.

A normal class lasts 45-60 minutes. Cognitive research indicates that attention wanes dramatically after about 20 minutes, which would indicate that unless the students are allowed some pause for thought, a significant portion of the curriculum is lost on the students during class.

The main objective of the SRS is to address these issues; in particular:

- Break the monotony of a lecture and allow the students to actively take part in the lecture
- Increase teacher-student interaction
- Give both teacher and students "real-time" feedback on learning effect

Technical overview

The SRS consists of three main components:

1. The voting device which the students use to submit a response during a voting session. This device can be a any HTML-compatible mobile unit (e.g. iPod Touch; iPhone; laptop)
2. The control interface (SRS-Ci), which runs on a computer in the classroom and is used to set up and run voting sessions by the teacher

3. The SRS server, which coordinates the communication between the control interface (SRS-Ci) and the voting devices. This involves setting up the voting devices with the appropriate number of buttons (i.e. buttons "A", "B", "C" etc. corresponding to the selected vote type); collecting the response from each unit and to processes the data to create graphical representations of how the students voted. The server also stores all the data of each individual voting session, so that the data can be analyzed at any time

A graphical representation of how the various components of the SRS work together can be found below:



Technical requirements for the SRS

This section describes the technical requirements for the hand-held units to be used by the students to submit a response, and also the requirements of the wireless internet connection

Requirements for hand-held units

There are two main requirements that the hand-held units must fulfill:

- Wireless internet connection (IEEE 802.11-compliant)
- Touch-sensitive screen

In principle, any hand-held device (such as a mobile phone with GPRS or 3G support) with a web browser could be used as a voting interface together with the SRS. However, it's extremely fiddly to vote using a device which isn't touch-sensitive, so in practical terms, touch-sensitivity is a requirement.

Requirements for wireless internet access point

The amount of data which is sent to and from each hand-held unit is negligible, so the 802.11g-compliant access point (capable of 54 Mbit/s) is adequate.

However, if the SRS is to be used in large classes with a large number of hand-held units (more than 50), it's important that the access point can handle such a large number of simultaneous connections. Quite often a (relatively low) limit on the number of concurrent connections is hard-coded into the access point, and this limit would have to be modified to reflect the number of iPods in use.

Some overhead should be added, because there may be other wireless units in use in parallel with the SRS (private mobile phones, laptops etc.).

A discussion of methodical approaches

The SRS can be used within a multitude of methodical and educational approaches. Two approaches are of particular interest, both of which have been tested by us:

1. *"Classical" approach*: Letting the students discuss 2-3 minutes between themselves in groups before doing a voting session
2. *Peer instruction*: each student first has to think individually through the quiz question before casting a vote. Once the vote is cast (and the result of the vote is shown to the students), a group discussion ensues, during which each student has to argue his or her position to the rest of the group. After the group discussion another vote is held, and the results between the two voting sessions can be compared

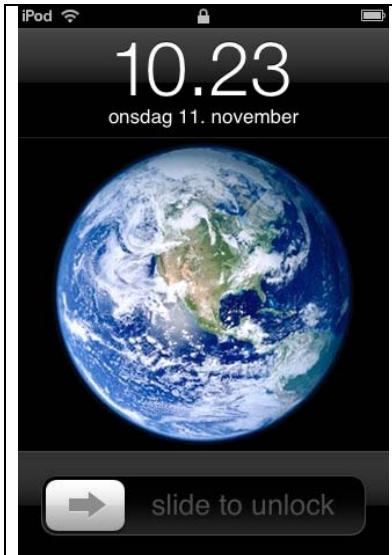
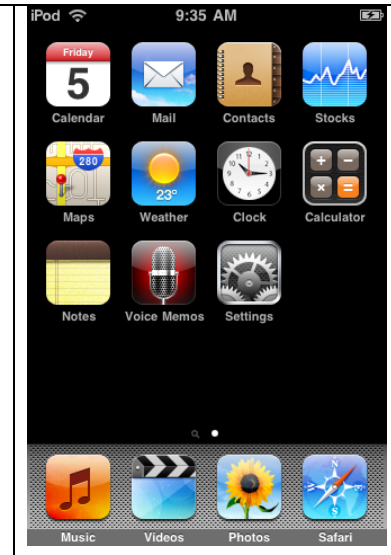
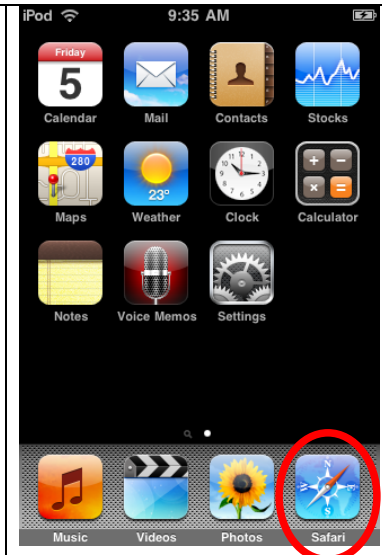
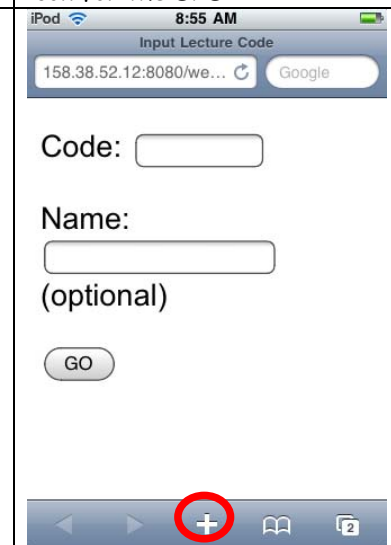
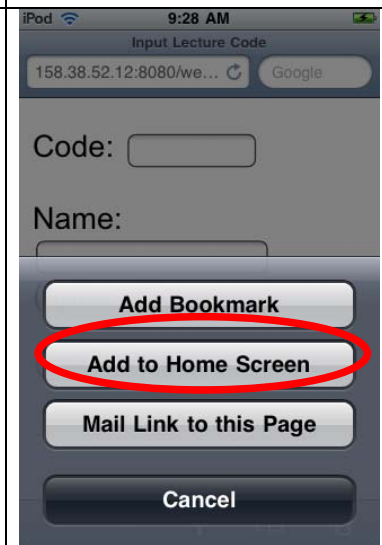
To illustrate the difference between the two approaches, a side-by-side timeline is described below:

"Classical" approach	Peer instruction
The quiz question is shown to the students	The quiz question is shown to the students
The students discuss between themselves for 3 minutes	The students think for themselves individually for 1 minute
A vote is held	A first vote is held without the teacher commenting on the results
The results are shown and commented by the teacher	The students discuss between themselves for 3 minutes
	A second vote is held
	The results are shown and commented by the teacher (who may or may not comment on the possible differences between the two voting results)
Total time used: 5-6 minutes	

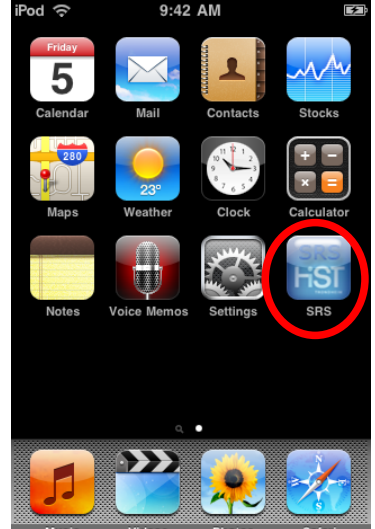
Setting up the iPod Touch for use with the SRS

The procedure below describes how to prepare the iPod Touch for the first time (this procedure only has to be completed once).

Adding a shortcut icon on the home screen of the students' iPod

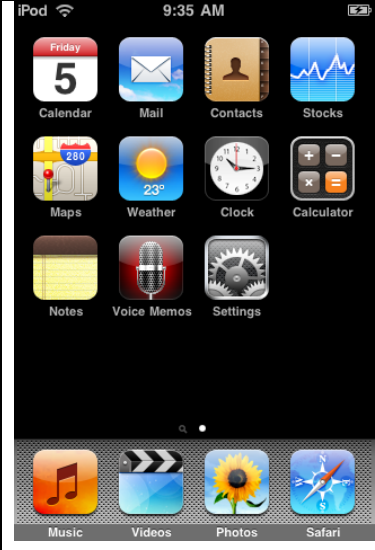
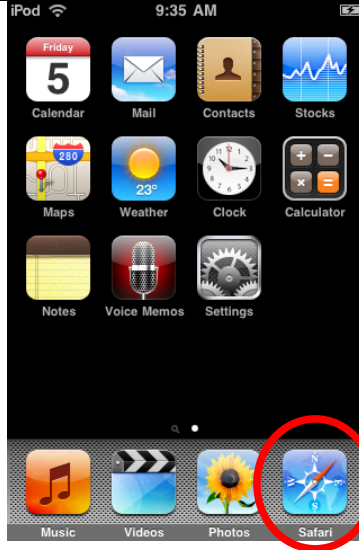
		
1. Unlock the iPod by moving the slider to the right	2. This is the home screen. We're going to add a shortcut icon for the SRS	3. Press the Safari icon to launch the iPod web browser
		
4. Enter the URL of the SRS server¹ into the browser and press 	5. Once the address has been entered, this page will appear. Press  at the bottom...	6. ... and Add to Home Screen

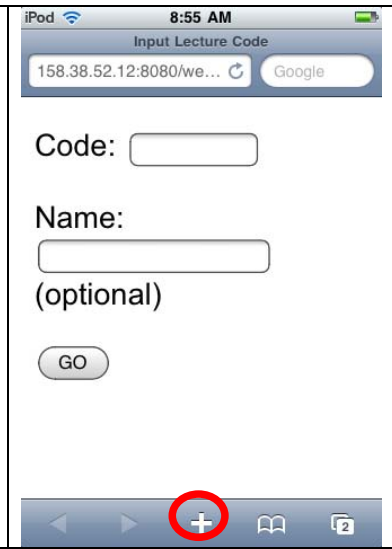
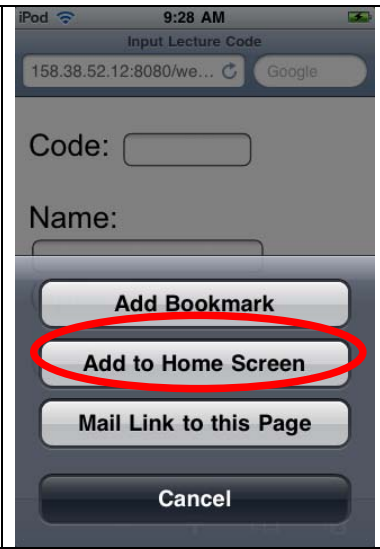
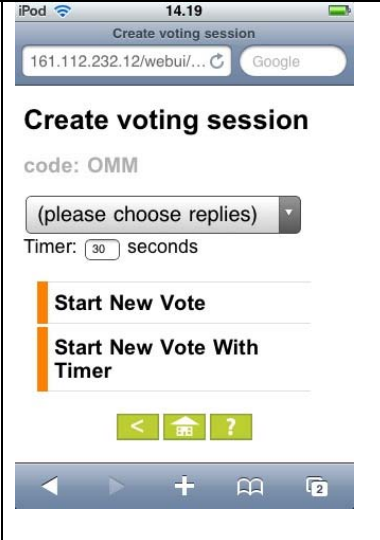
¹ The URL depends on which server you want to connect to. See Appendix F: Voting device URLs for which URL to use.

		
7. Enter a label name for the home screen icon and press Add	8. The icon now appears on the home screen	9. Pressing the home screen icon launches the students' SRS page directly

Adding a shortcut icon on the home screen of the teacher's iPod

The same procedure above can be used to add an icon on the home screen of the teacher's iPod as well. Pressing this button launches the teacher's web interface for setting up a voting session.

		
1. Unlock the iPod by moving the slider to the right	2. This is the home screen. We're going to add a shortcut icon for the teacher's web interface	3. Press the Safari icon to launch the iPod web browser

		
4. Enter the URL of the teacher's web interface² into the browser and press 	5. Once the address has been entered, this page will appear. Press  at the bottom...	6. ... and Add to Home Screen
		
7. Enter a label name for the home screen icon and press 	8. The icon now appears on the home screen	9. Pressing the home screen icon launches the teacher's web interface directly

Duplicating an iPod setup using backup and restore in iTunes

It can be a time-consuming task to configure a class set of iPods. An easy way to ensure that all the iPods have identical setups is to use the backup and restore feature in iTunes.

² See

Appendix F: Voting device URLs for the URL to use, as well as the login credentials (the teacher's web interface is password-protected for security reasons)

1. The first step is to configure a "master" iPod, the setup of which will be duplicated on to all the other units. Specifically, the settings which should be configured are
 - a. The SSID ("name") of the wireless network (**Settings** -> **Wi-Fi** and select the correct network from the drop-down list. A password may be needed if the network is encrypted)
 - b. Disable the keyboard Auto-Correction feature by pressing **Settings** -> **General** -> **Keyboard** and setting **Auto-Correction** to **OFF**
 - c. Add the relevant home screen shortcuts to the SRS (see Adding a shortcut icon on the home screen of the students' iPod)
2. Install the iTunes application (<http://www.apple.com/itunes>) on a computer which will be used to configure the iPods
3. Connect the iPod to the computer using the USB cable which was supplied with the iPod
4. Start iTunes
5. The iPod will be listed in the **DEVICES** category on the left. Click on the **Never Register** button³ (see below)

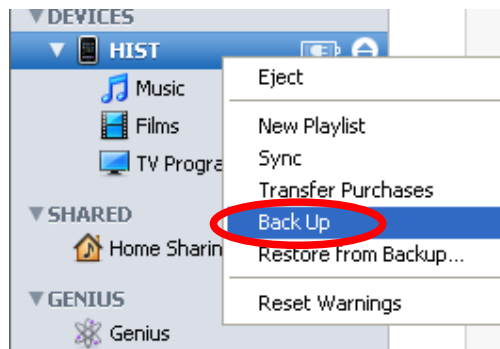


6. Once you've clicked **Never Register**, the screen layout will be as indicated below:

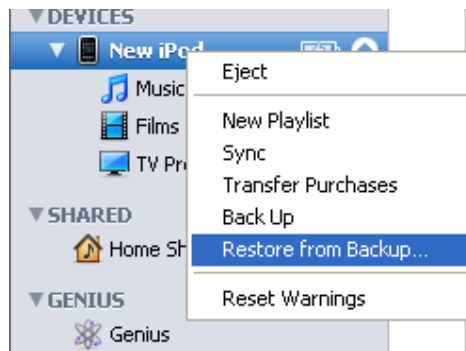
³ For this purpose, it's not necessary to register the iPod with Apple



7. Right-click on the iPod in the menu on the left, and then select **Back Up** (see below)



8. The contents will be now backed up to the computer. **Important note:** the name of the backup set will be identical to the name of the device ("HiST" in the example above). This name has be selected when you make the restore in the next step
9. Once the backup is complete, disconnect the current iPod and connect one onto which the backup set is to be restored
10. Once the new device is connected, you may have to click **Never Register** again
11. Right-click on the device name in the menu on the left and select **Restore from backup...** (see below)



12. Once the restore is complete (the process should only take a few seconds⁴), you can disconnect the device and connect a new one
13. Repeat the restore process as many times as necessary to configure all the iPods in the class set
14. You may want to check that the restored iPods have been properly configured - i.e. that all the settings of the "master" iPod have been successfully propagated

⁴ Sometimes iTunes will insist that you update the iPod firmware to the newest version before you're allowed to do a restore. Updating firmware is a process which can take up to 5 minutes.

Checklist for first-time use of the SRS

To ensure that the students take well to the idea of using SRS in class, it's important that the students are properly introduced to the system before it's used for the first time.

We recommend that the following checklist be completed before the SRS is used in class:

- Check that the classroom in which the SRS is to be used has **sufficient wireless network coverage** (if wireless units are to be used)
- Make sure the SRS interface is properly installed and tested on the teacher's computer
- Have a one or more colleagues check that the quiz questions are **clear** and **unambiguous**
- If handheld voting units are to be handed out to the students, make sure they are **fully charged** and properly configured (e.g. set up for wireless network access with proper SSID, WEP passwords etc.)
- Make sure that the logistics of handing out voting devices (if handheld units are used) are under control
- When the class starts, hold a 15-minute introduction to the SRS, during which the purpose of the SRS is explained, and the students are made familiar with the interface on the devices used for casting votes

Using the SRS in class

Below is a timeline of a typical SRS session, with images illustrating each step of the process:



Handheld units are distributed to the students (preferably before the class starts)



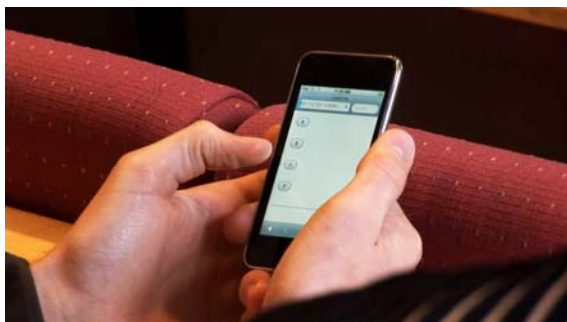
The students are presented with a multiple-choice quiz question, where only one alternative correct



The students are given time to discuss between themselves (in the *peer instruction* paradigm, they are given time to think through the question individually first)



From the SRS interface, the teacher starts the voting session (a timer/countdown mechanism can be used, if desired)



Each student casts a vote as to what the correct answer is, using the handheld unit. The vote closes and the results are shown to the students in the form of an histogram.



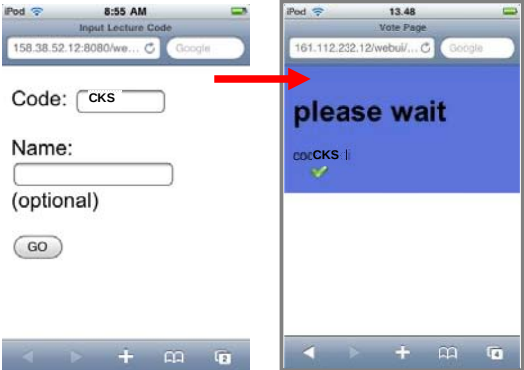
The instructor will comment the various alternatives and highlight the correct one - explaining thoroughly why it's the correct one; and why the other ones are incorrect.



The lecture proceeds as normal.

To further illustrate the process of using the SRS in class, the table below shows the process from the perspective of both the teacher (who sets up the voting session) and the students (who submit the vote/response using the hand-held units).

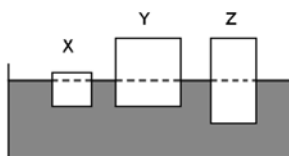
The user interface for the teacher and the students during a vote

Teacher's user interface	Students' user interface (iPod)
1  The teacher starts the interface by double-clicking the SRS icon  on the desktop	 The students unlock their iPod
2  The teacher logs on to the server which hosts the session (the exact server name and credentials depend on which server is used - this information can be found in the appendix)	 The students access the SRS student interface by pressing the home screen icon
3  Toolbar is partially hidden by default The starting page with the session code appears	 The students type in the designated session code and optionally their name (enables the system to track who votes what) and the page "please wait" appears - this page is a confirmation to the students that the session code has been correctly set and that the device is ready for voting.

Quiz question

4

3 objects (X, Y and Z below) are floating in water.



Which object has the largest mass density?

- A. Object X
- B. Object Y
- C. Object Z
- D. I don't know

The quiz question is shown to the students, and the students are instructed to start discussing between themselves



The students discuss between themselves what the correct answer is



5

Move
cursor
here



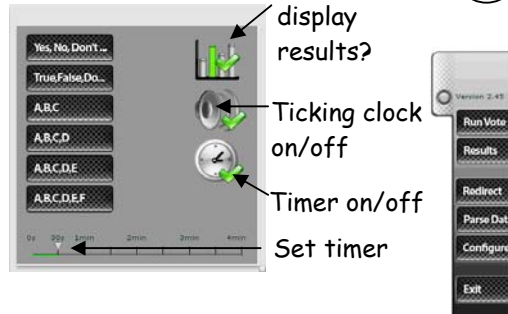
The teacher moves the mouse cursor to the toolbar which is partially hidden at the right hand side of the screen. Once visible, the teacher clicks the **Run Vote** button



The students continue their discussion while the teacher prepares for the vote



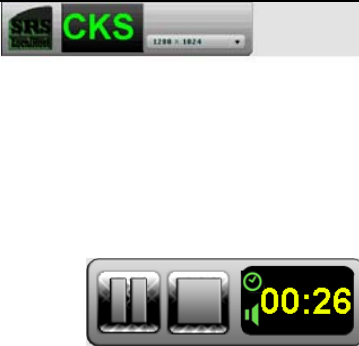
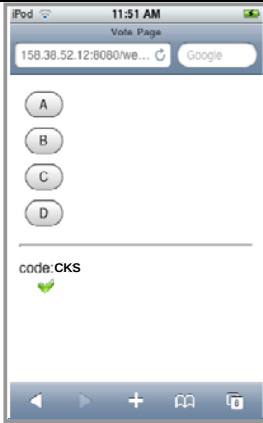
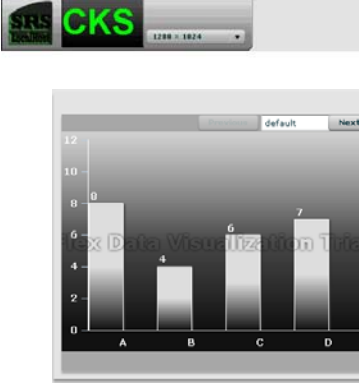
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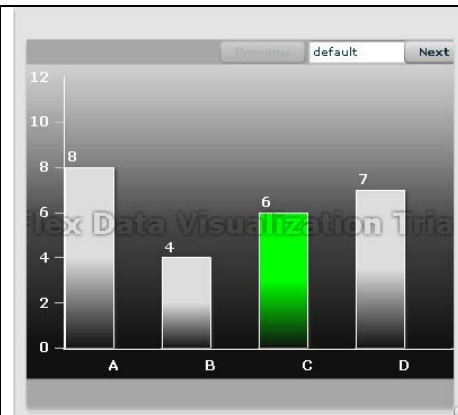


The teacher can choose whether the results be shown automatically after the vote; and whether the vote should have a **timer** or a **ticking clock sound**. The teacher selects the appropriate question type to initiate the voting session



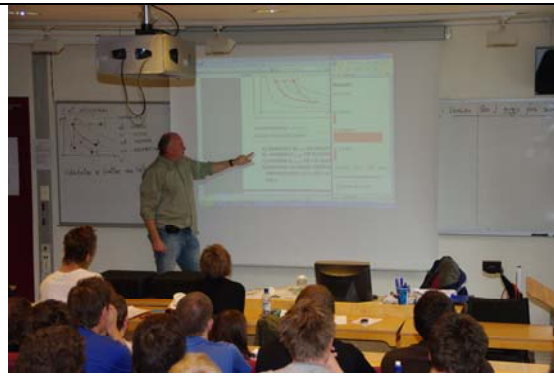
The students are ready to vote

 7 Once a question selection is made the play controller appears. Press  (play), and the vote is in progress. The vote can be paused at any moment by pressing  (the students can continue voting while the session is paused, but the countdown stops)	  The students cast their votes
 8 The vote is in progress	  Each student receives a confirmation that the vote has been registered. They can change their mind at any time by clicking another button
 9 Once the vote is closed, a histogram of the votes appears. The histogram can be moved freely around	  The handheld units are ready for another vote



The teacher highlights the correct answer by clicking on the bar corresponding to the correct alternative, and explains why the alternatives are correct or incorrect

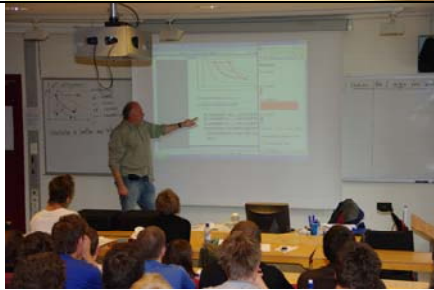
10



In our experience, the students very keen to "defend" their vote when challenged by the teacher (the teacher may challenge some of the students to explain why they voted as they did)

Methods for displaying the quiz questions to the students

Depending on the facilities available in the room where the SRS session is held, there are several ways to display the quiz questions to the students before the voting starts.

Display surface	Image	Comments
Flipover chart		Only suitable for small rooms
Whiteboard/blackboard		
Overhead projector/document camera		The use of a document camera requires a video projector be installed in the class room
Video projector		Can be used to display ready-made quizzes in Word, PowerPoint, SMARTNotebook or similar tool.

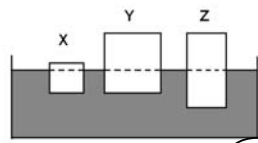
Using the SRS interface in conjunction with PowerPoint and similar applications

As detailed in Appendix A: Reference guide for the SRS control interface (SRS-Ci), the SRS control interface (SRS-Ci) puts itself as a transparent layer on top of other applications, which makes it easy to show questions on the computer running the SRS.

If the computer running the SRS is connected to a projector, the recommended method for showing the quiz question to the students would be to use PowerPoint or similar application running on the SRS computer.

Quiz question

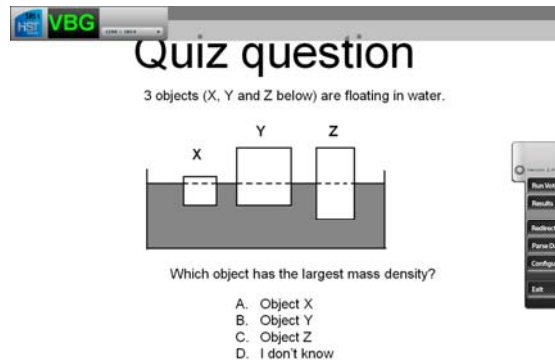
3 objects (X, Y and Z below) are floating in water.



Which object has the largest mass density?

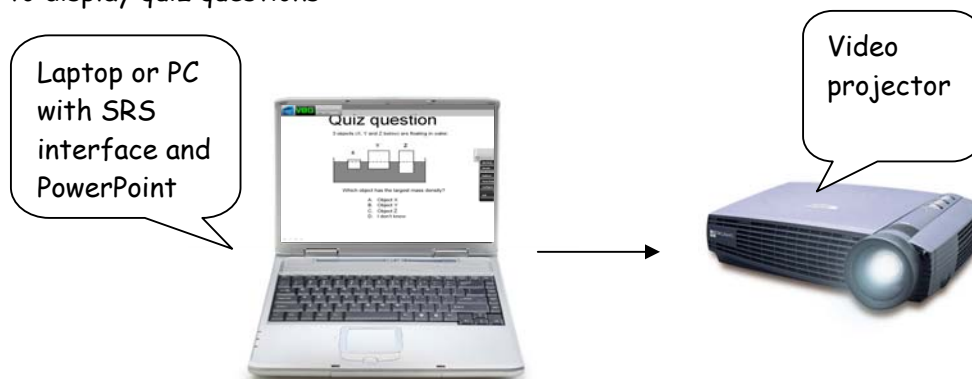
- A. Object X
- B. Object Y
- C. Object Z
- D. I don't know

Click here
to reveal
the toolbar



A PowerPoint slide show with the toolbar hidden at the right-hand side of the screen The same slide show with the toolbar revealed, ready to run a vote

The figure below illustrates the scenario in which the PC with the SRS installed is used to display quiz questions:



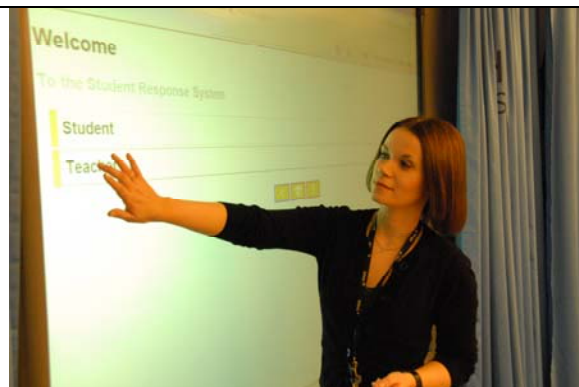
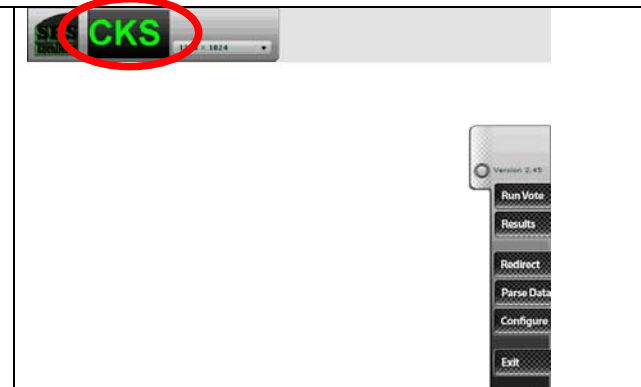
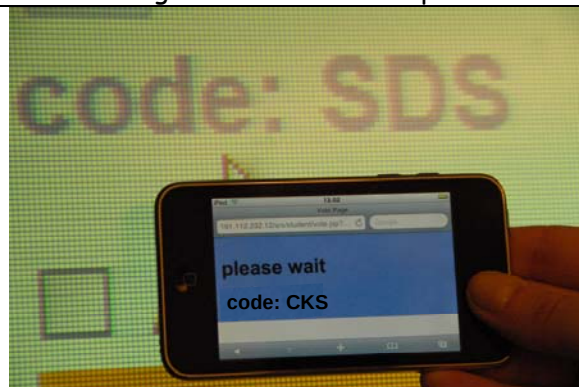
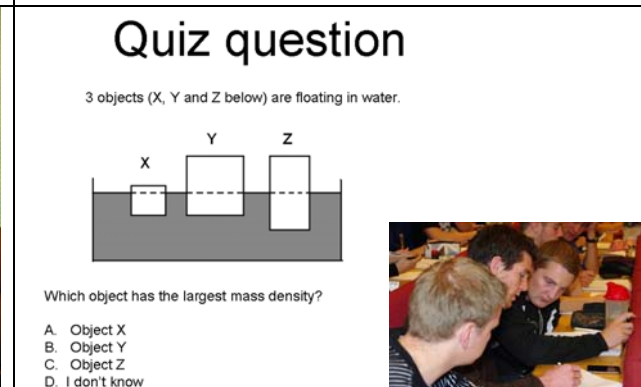
Using the SRS from a PC/laptop

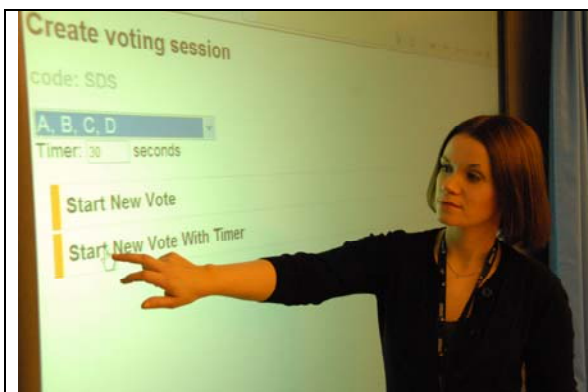
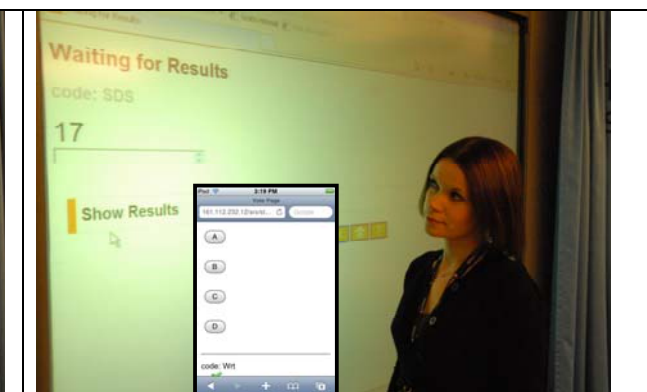
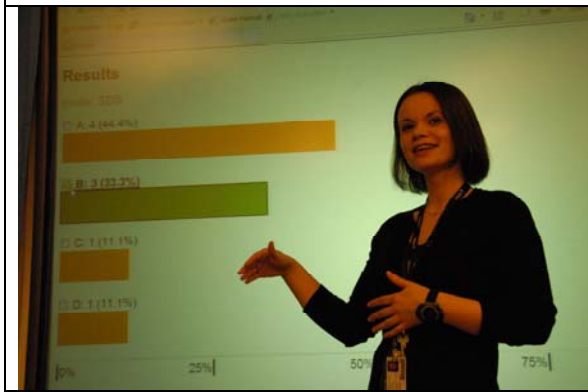
Because the SRS is a web-based application, both the control interface (for creating voting sessions) and the student's interface for casting votes, can be used from any device with a web browser. This means that both the teacher and the students can choose to operate the SRS (creating votes or submitting responses, respectively) using a PC.

Typically, the teacher would use a PC in the classroom to create voting session. The SRS integrates seamlessly with digital whiteboards, so we will describe the operating procedure where the teacher creates a voting session from a digital whiteboard.

The students, on the other hand, could use a laptop to submit their responses. These procedures are described below.

Setting up an SRS session from a PC connected to a digital whiteboard

	
The teacher logs on to the teacher's SRS interface by clicking on desktop shortcut and entering the user name and password	The teacher then has access to the SRS interface. Notice the session code at the top
	
The teacher makes sure that the system-generated session code is communicated to the students (e.g. by writing it on the digital whiteboard), who enter it on their iPods,	The quiz question is shown to the students on the digital whiteboard, and the students are instructed to start discussing between themselves

	
After a couple of minutes of discussion, the teacher selects the appropriate question type and chooses whether to use a timer or not	The vote is in progress and counting down, while the students vote using their iPods
	
The voting session is finished and the teacher highlights the correct alternative, and explains why the answer is correct	The teacher may also challenge the students to explain why they voted the way they did

Using laptops or other hand-held units to cast votes

The SRS is a standard web application, and so any HTML-compliant device with wireless network support can be used by the students to cast their votes. This includes laptops and touch-sensitive devices and cell phones.

The procedure to operate the SRS is identical to the one outlined on page 16.

Methodical best practises

Rigorous testing of various methodical approaches is being planned, to see which approach maximizes learning effect. At this stage, no statistically valid results are available from our testing.

Based on observations so far, however, on a purely qualitative basis, it appears that the *peer instruction* approach (in which each student is given time to think through the

question before the group discussion) engages the students to a greater extent than going directly into a group discussion before the vote is cast.

Logistical considerations

The SRS is designed to be used in large classes, and the server/client infrastructure is very scalable. However, the simple task of handing out handheld units for hundreds of students can present a logistical challenge.

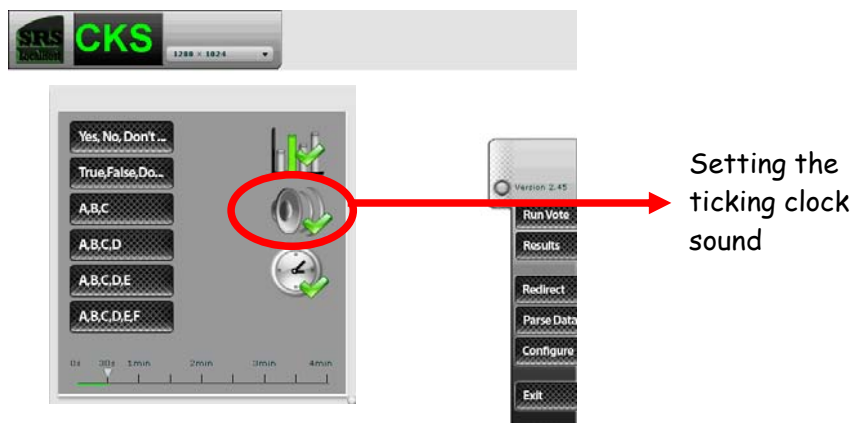
The most efficient way to distribute a large number of handheld units is to have the students pick up a unit as they enter the classroom, and hand it back as they leave the class.

Alternatively, handheld units can be given on loan to the students at the start of a term, on the condition that the unit is handed back in at the end of the term. In this scenario, each student would be individually responsible for his or her unit - making sure it's charged; bringing it to classes and so on.

Timed versus non-timed voting sessions

The SRS is designed to be used in large classes, and maintaining order and discipline is a priority. After a group discussion, the teacher will want to start a voting session. But it can be challenging to restore order and attention in a class in which hundreds of students have been engaged in serious discussion. In particular, to make all the students, some still fiercely involved in the discussion, aware that a voting session is about to begin.

To aid the teacher in restoring order for the voting session, the SRS can be set to play back a "ticking clock" sound during the countdown (see below).



Our experience shows that using such a sound is invaluable in shifting the students' attention away from the discussion, and over to the voting session in progress.

In our experience, a 30-second countdown is sufficient - any longer than that and the students quickly lose patience. Remember that when the vote starts, the students have already completed their discussions and made up their minds. Therefore, 30 seconds should be enough to let everybody press the button on their iPod corresponding to the alternative they think is correct.

The teacher's role

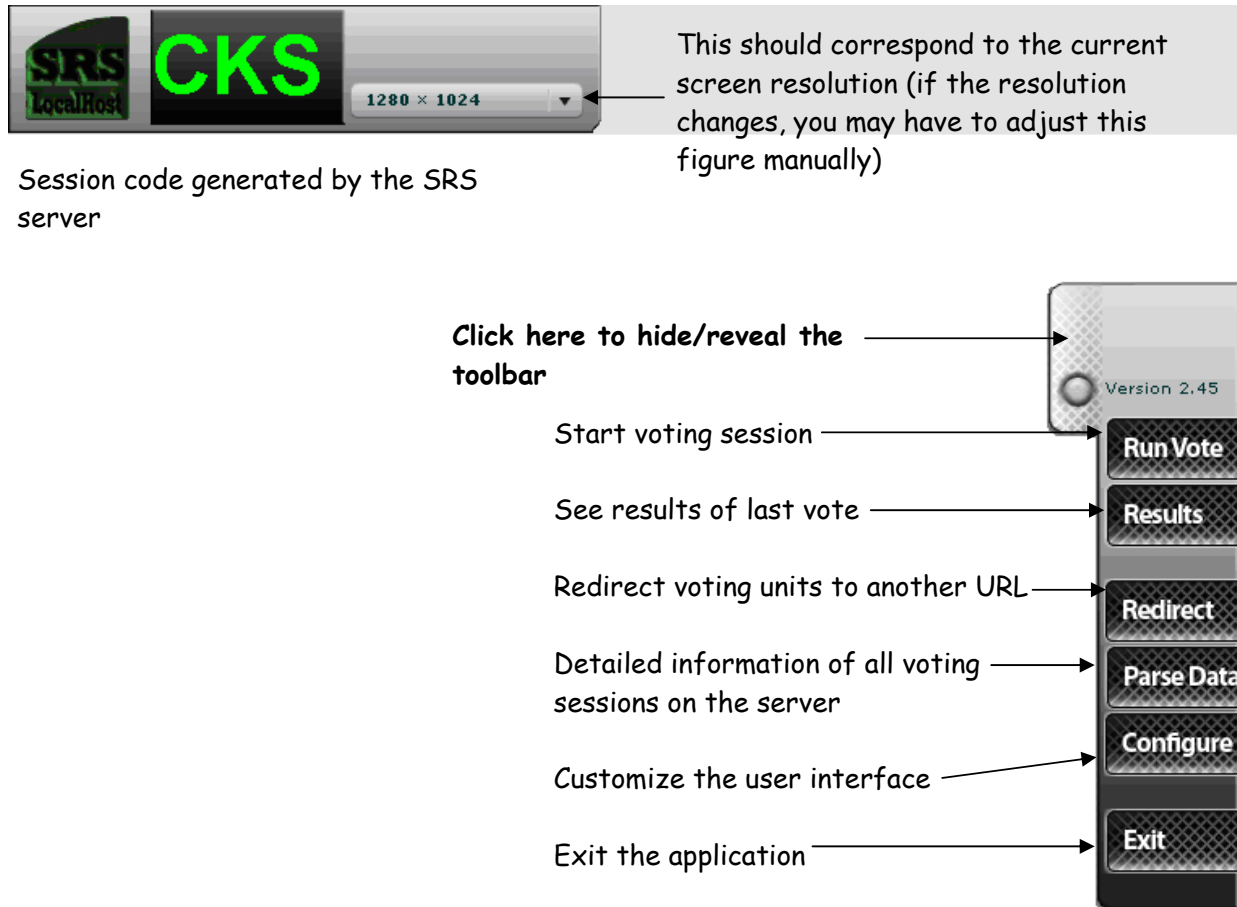
Based on the feedback we've received, it's critically important for the students that the teacher

- Thoroughly explains what the correct alternative was, and why
- Puts a lot of effort into stimulating the discussion between the students - in some classes, the discussion can be a bit heavy-going unless the teacher aids the process along. This problem is exacerbated if the students don't know each other very well

Appendix A: Reference guide for the SRS control interface (SRS-Ci)

This section explains all the various features of the SRS control interface (SRS-Ci).

Interface overview

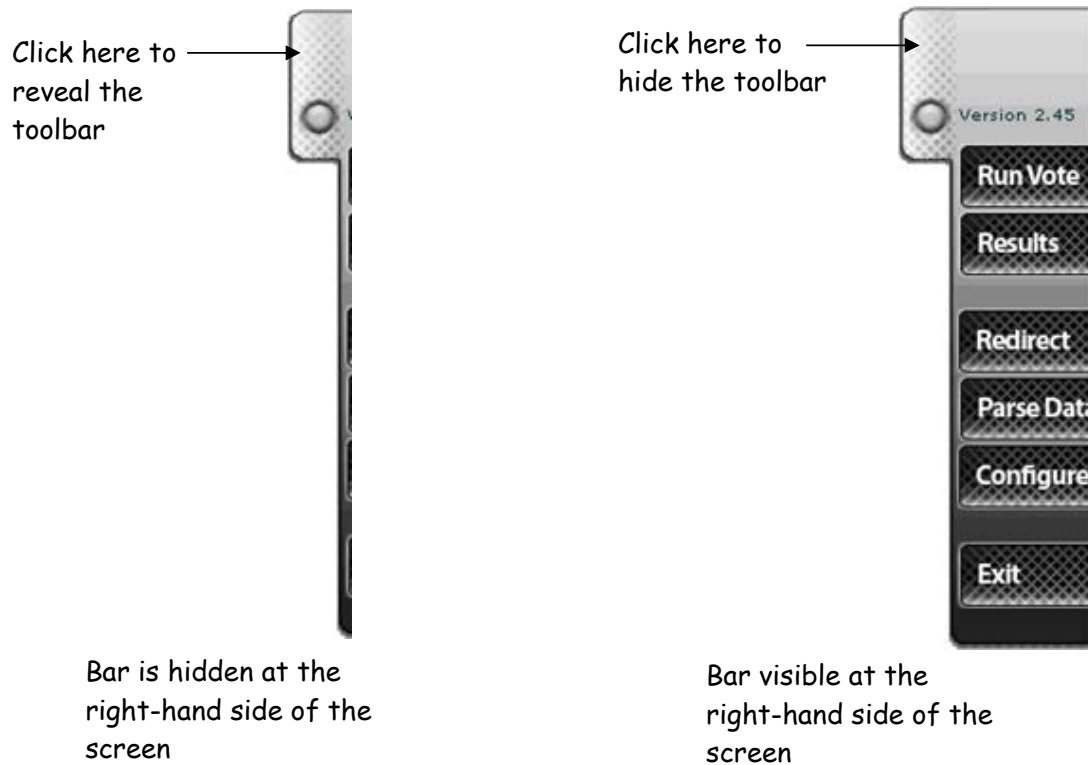


The SRS interface as a transparent layer on top of other applications

The SRS control interface (SRS-Ci) has been designed to put itself as a transparent⁵ layer on top of other applications which run on the computer.

When the toolbar is hidden, the transparent layer is invisible. Once the toolbar is revealed, the interface puts itself on top of the other windows that are open on the computer.

⁵ The opacity of the layer can be adjusted by clicking on the **Configure** button



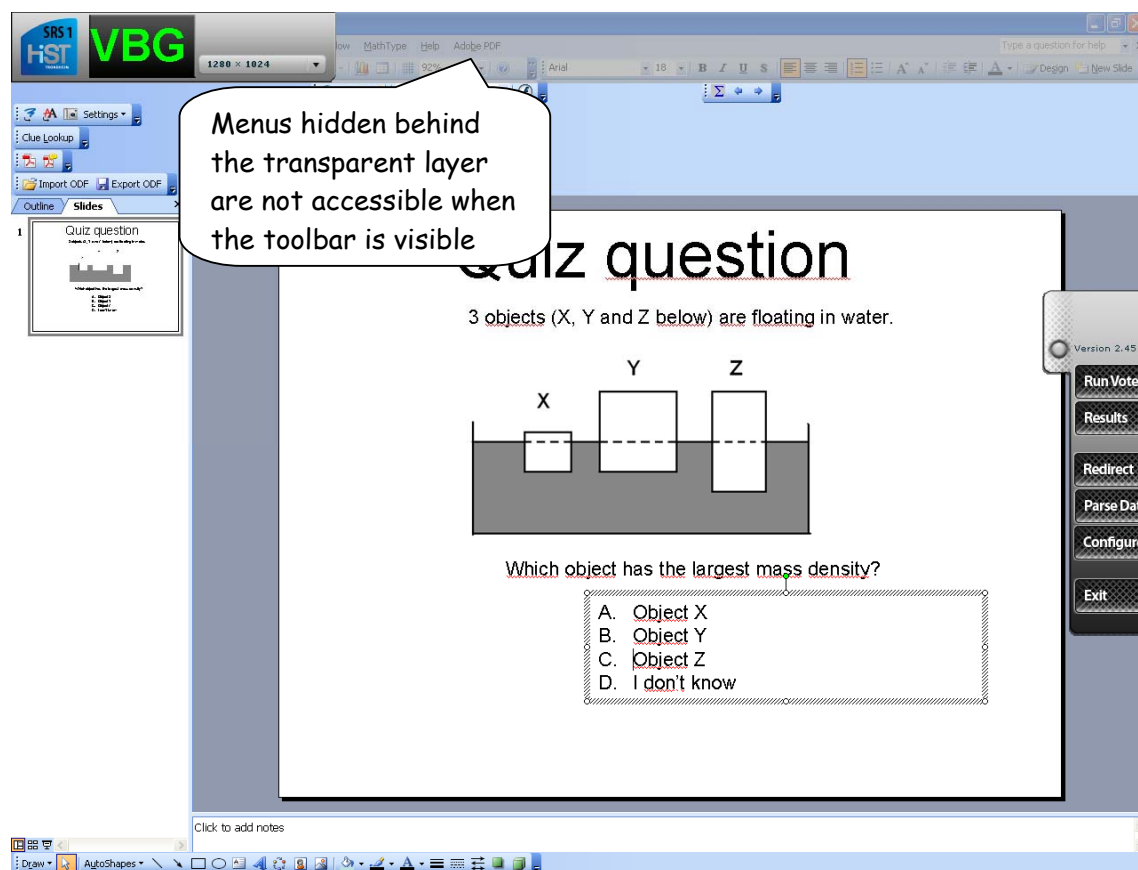
Accessing windows behind the transparent layer

The SRS has been designed to facilitate a smooth transition between showing e.g. a PowerPoint with a quiz question, and starting a vote.

In certain situations it's necessary to hide the toolbar in order to access windows and menus behind the transparent layer:

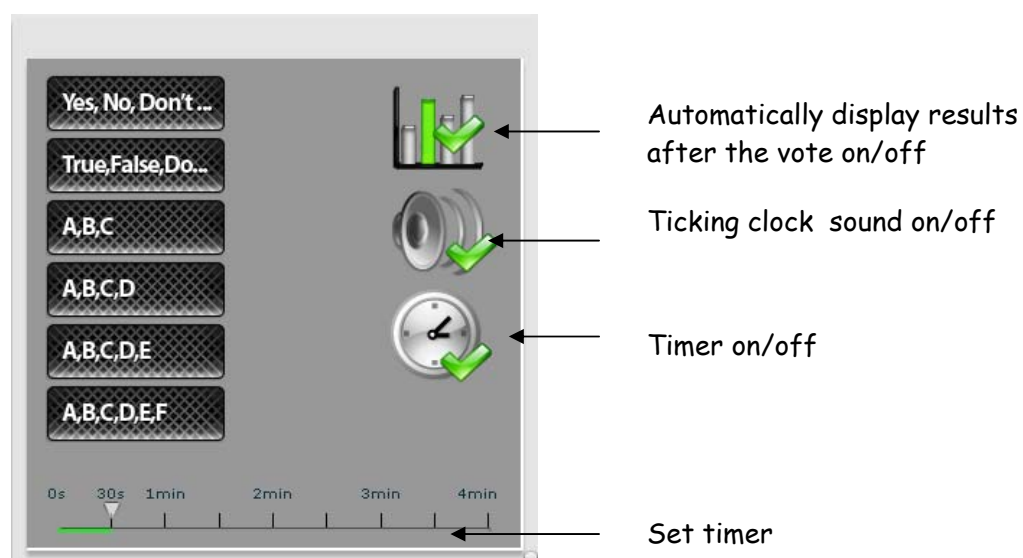


When the toolbar is visible and the transparent layer is active, it's not possible to click icons or windows which are lying "behind" the top of the transparent layer. In order to access those windows, you have to click the toolbar as indicated above to hide the toolbar



Running votes

Clicking on the **Run Vote** button opens up the question type dialogue box, in which the teacher chooses the number of alternatives for the quiz:



Once you click on a question type button (e.g. ) , a vote controller pops up (see below):



Click on  to start the vote

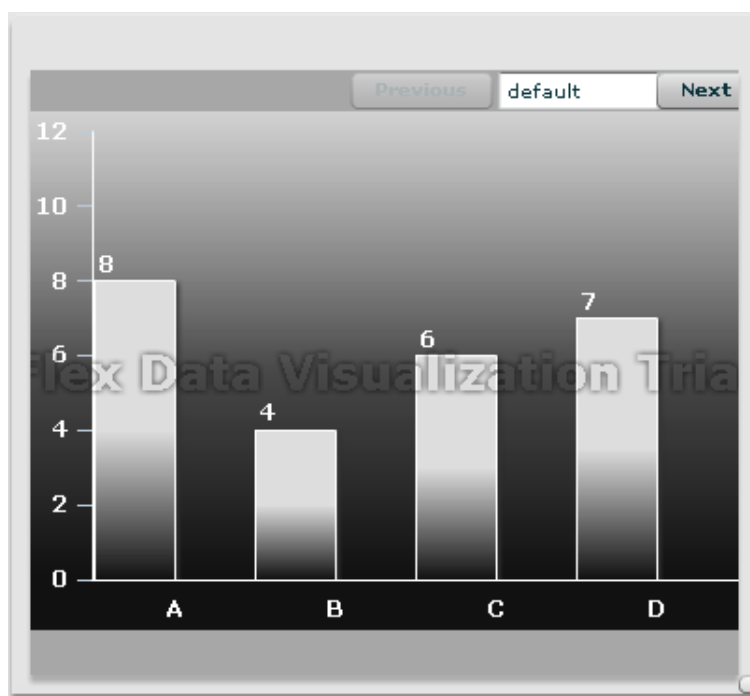


Click  to pause the vote and  to stop the vote and display the results

The students can continue to cast their votes while the session is paused, but the countdown will stop until the  is pressed to resume the vote.

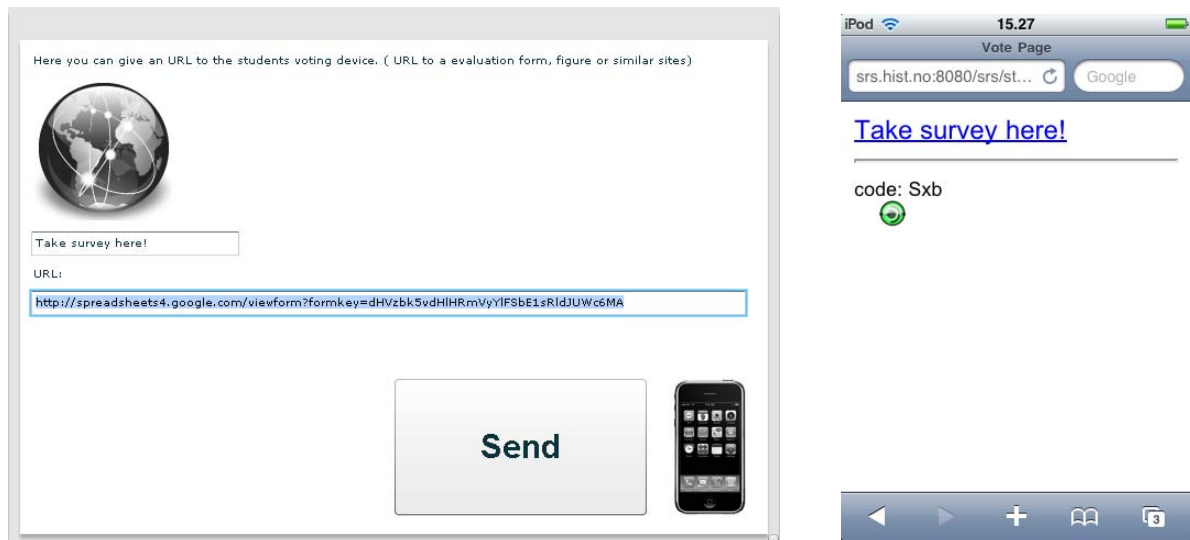
Displaying the results of the last vote

Clicking the  button brings up a histogram for the results of the last voting session:



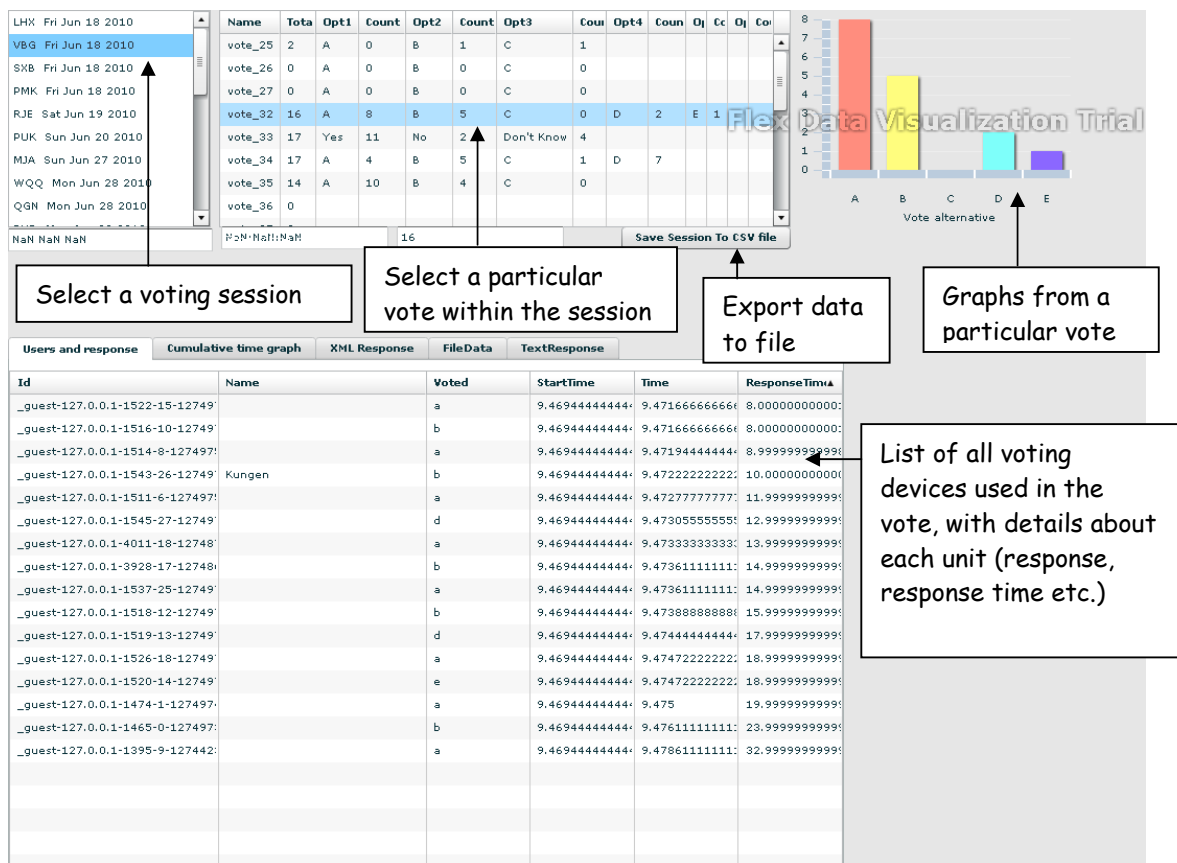
Redirecting the voting devices

The  button is used to redirect the voting devices, by replacing the default "Please wait" page with a page containing a link specified with the teacher (see below):



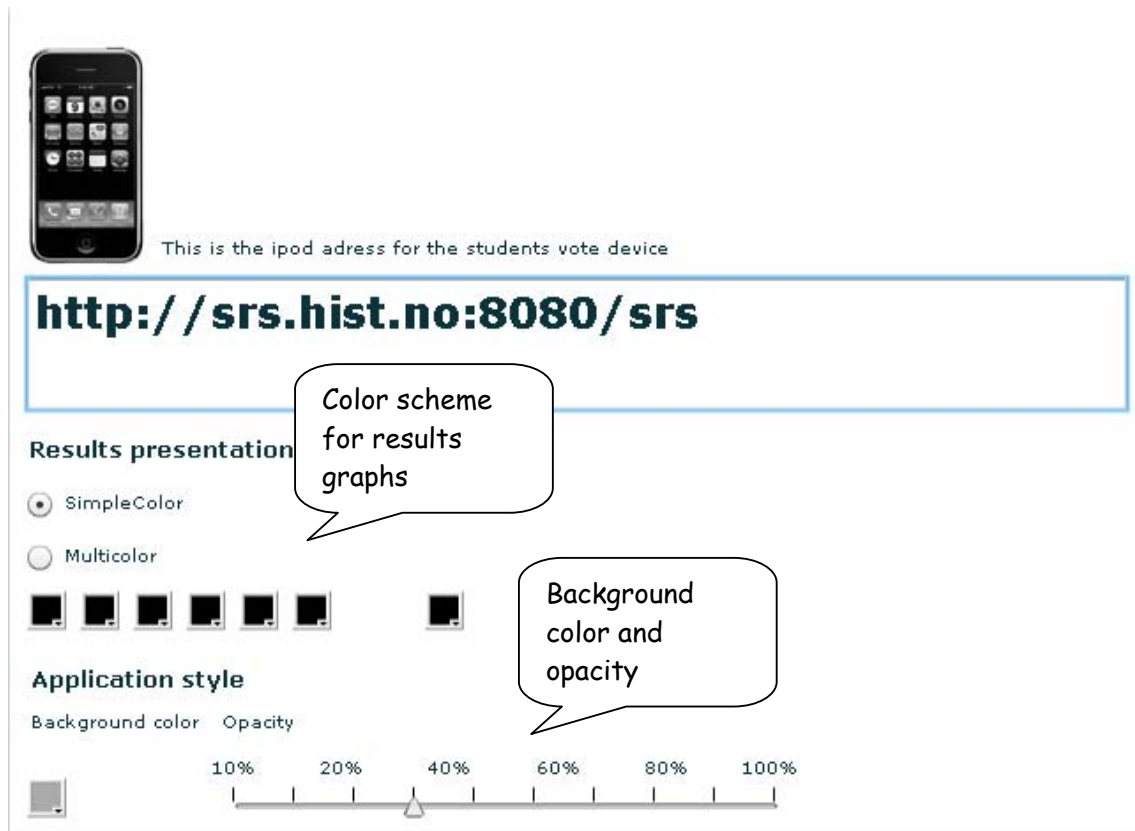
Getting detailed information about each individual vote

The **Parse Data** button opens up the interface for viewing detailed information about every voting session which is stored on the SRS server.



Configuring the user interface

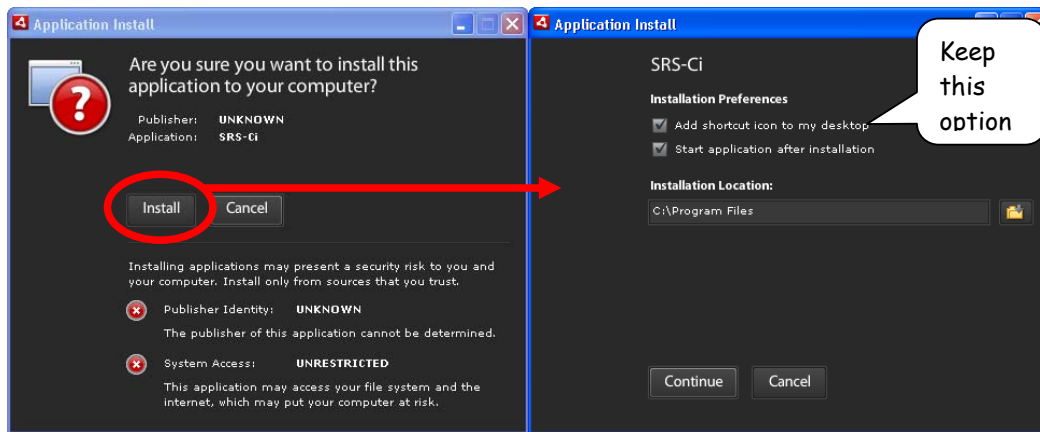
Clicking on the **Configure** button brings up the dialogue box for customizing the user interface of the SRS:



Appendix B: Installing the SRS control interface

This section describes how to install the SRS control interface on the computer which is to be used to run votes.

1. Download the Adobe AIR installer from <http://get.adobe.com/air>
2. Double-click on the downloaded file and follow the on-screen instructions for installing Adobe AIR
3. Download the SRS installer file (this file has the extension .air) from <http://projekt.hist.no/edumecca/downloads/SRS-Ci-latest.air>
4. Double-click on the downloaded file and follow the on-screen instructions



5. The SRS will start automatically after the installation, if this option was selected
6. To start the SRS manually, double-click the  icon on the desktop

Appendix C: Setting up an SRS server

This section describes how to install the SRS server component, which coordinates the feedback to and from the voting devices; processes the feedback to generate graphs and stores all the data of each individual voting session in a database.

The communication between the SRS server and the voting devices uses JavaServer Pages (JSP), which is a framework for creating and serving dynamic web pages (e.g. the dynamically generated buttons on the voting devices). To serve JSP pages, we use the Apache Tomcat server, which is the JSP equivalent of the highly popular Apache HTTP server.

In this scenario we assume that the SRS server has a public IP, and will communicate with the voting devices over the internet.

Server hardware requirements

For a server which can serve up to 200 – two hundred – simultaneous connection, the following specifications are recommended for the PC running the software:

Processor: Intel Core 2 Duo 2 GHz or better

Memory: 4 GB of RAM

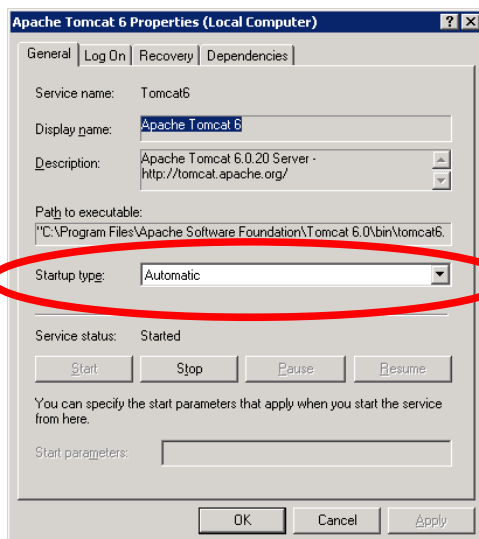
Operating system: Windows XP or Windows 7

Software installation instructions

This section describes how to install the necessary software components on the SRS server.

Installing the Apache Tomcat web server

1. Install the Java Runtime Environment from <http://java.com> (click on the Free Java Download button)
2. Download and install the Apache Tomcat server from <http://tomcat.apache.org/>. We recommend the **32-bit/64-bit Windows Service Installer**, which installs Tomcat as a Windows service (this means that the Tomcat always runs, even when nobody's logged on to the server)
3. Check that the Apache Tomcat service has been configured to start automatically by clicking on **Start Button -> Control Panel -> Performance and maintenance -> Administrative Tools -> Services** and right-clicking on **Apache Tomcat** in the list of services. Select **Properties** and get the dialogue box below:



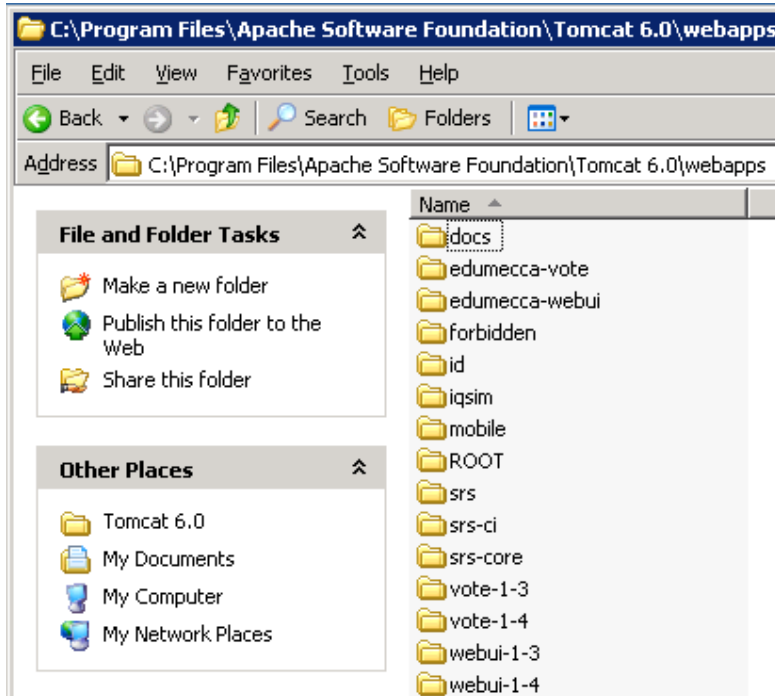
Make sure the Startup Type is set to Automatic

Installing the SRS server application

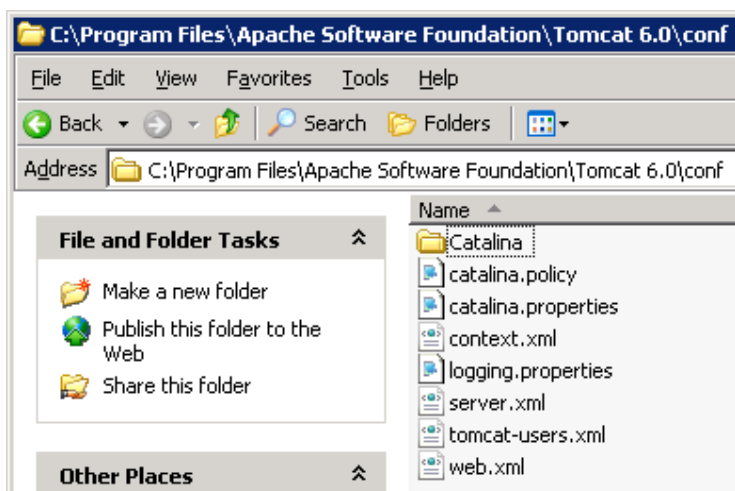
The SRS server component is an Apache Tomcat web application. The source files have been compressed into a ZIP file for easy deployment.

1. Download the file <http://prosjekt.hist.no/edumecca/download/SRS.zip>

2. Unzip the files into the following directory: `C:\Program Files\Apache Software Foundation\Tomcat X.X\webapps` (X.X varies depending on which version of Apache Tomcat you're running. For example, X.X could be 6.0 or 7.0). After this process, the directory should look like the image below:



3. Download the file <http://prosjekt.hist.no/edumecca/downloads/conf.zip>. This is an Apache Tomcat configuration file which has been modified to suit the requirements of the SRS server
4. Unzip the file into the directory `C:\Program Files\Apache Software Foundation\Tomcat X.X\conf` (answer "yes" overwrite any existing files). After this process, the directory should look like the below indicates:



- Restart the Apache Tomcat server by clicking **Start Button -> Control Panel -> Performance and maintenance -> Administrative Tools -> Services** and left-clicking on **Apache Tomcat** in the list of services. Click on **Restart** to restart the server



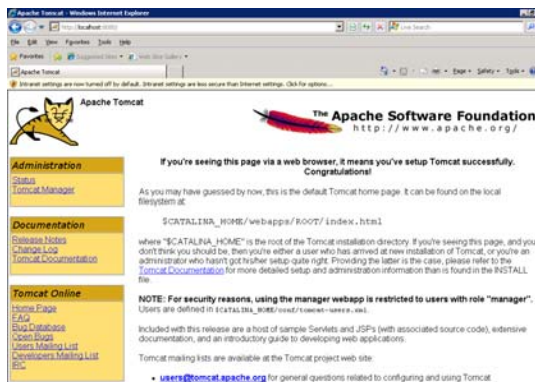
You have now installed the SRS server application, which can be used in conjunction with the SRS control interface (SRS-Ci) to run votes.

Testing the software installation

To make sure that the SRS server has been correctly set up, the following items should be checked:

Checking the Apache Tomcat installation

- To check that the Apache Tomcat JSP server is correctly installed, open up a web browser and enter the following address: <http://localhost:8080>
- If Apache Tomcat has been correctly installed, a generic Apache Tomcat page will be displayed (see below)



← This displays the file C:\Program Files\Apache Software Foundation\Tomcat X.X\webapps\ROOT/index.html

- If the above page doesn't load, please check the Apache Tomcat documentation

Checking the communication between the SRS server and a voting device

- On a computer which has the SRS control interface (SRS-Ci) installed, start the SRS interface by clicking on the  icon on the desktop

2. Once the login window appears, click on the **Advanced** button and modify the settings as indicated below (here we assume that the IP address of the server is 192.168.1.2 - all instances of this address should be substituted with the public IP address or DNS name of your server)

3. If the information has been entered correctly, the box below will be displayed (the list of existing session codes may be empty, if no previous voting sessions have been run on the server):

4. Click either **Create New Session** or select an existing session code and click **Run with existing session**. The SRS control interface will appear (see below):



5. Once the session code has been established, enter the following URL on the voting device (we still assume that the IP address of the server is 192.168.1.2):
<http://192.168.1.2:8080/srs/student>
6. The following page should appear on the voting device:



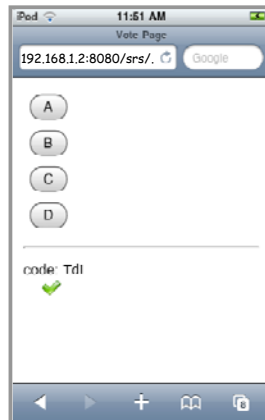
7. Enter the session code displayed on the SRS control interface
8. The following page should appear on the voting device:



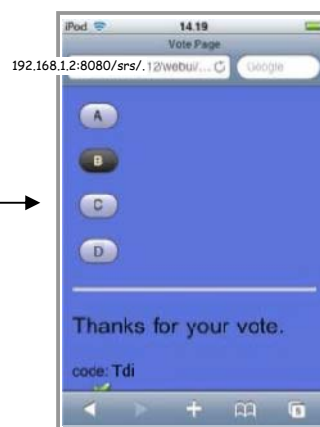
9. Run a couple of votes from the SRS control interface, and check that the buttons appear correctly on the voting device, and that the results are displayed correctly (see below)



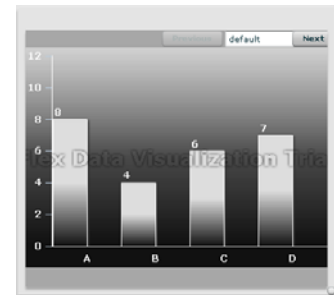
Run vote



Buttons appear



Vote confirmation



Results

Appendix D: Setting up a stand-alone, portable SRS installation

This section describes how to set up a stand-alone, "portable" SRS installation, by having both the server and the SRS interface on the same computer. To make the installation portable, we recommend using a laptop in conjunction with a wireless router to set up a closed, local network (unlike the scenario described in Appendix C: Setting up an SRS server, which assumes that the server has internet access).

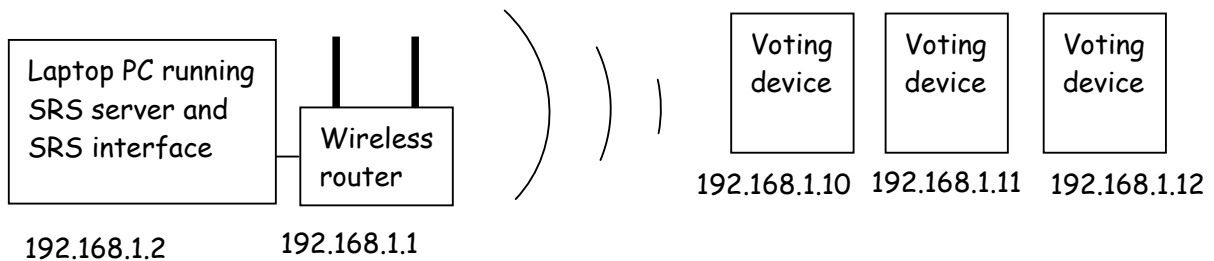
This allows the SRS to be used at **any** location - internet access is **NOT** required, since this is a closed, local network.

Technical requirements

This stand-alone, portable SRS installation requires two components:

1. A laptop PC (this should comply with the technical specifications for the SRS server specified on page 33)
2. A wireless router (access point) with a built-in DHCP server

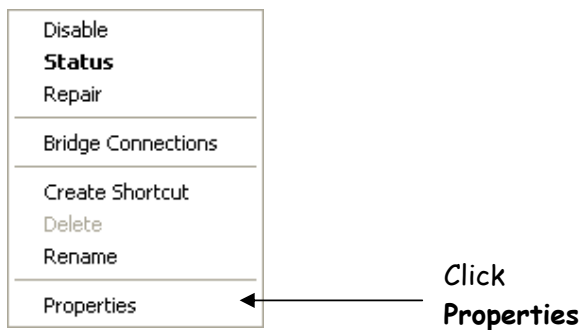
In this scenario, a closed, wireless network is set up for the communication between the SRS server (the laptop) and the voting devices. A schematic view of the scenario is depicted below (the IP addresses of the various units will be described in more detail):



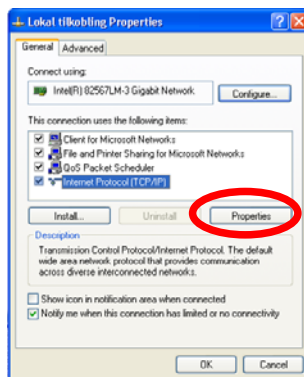
The laptop is connected to the router by an ethernet cable and given a **fixed IP address**. The voting devices connect to the wireless network and are given **dynamic IP addresses** by DHCP.

Setting up the SRS laptop (running both server and SRS interface)

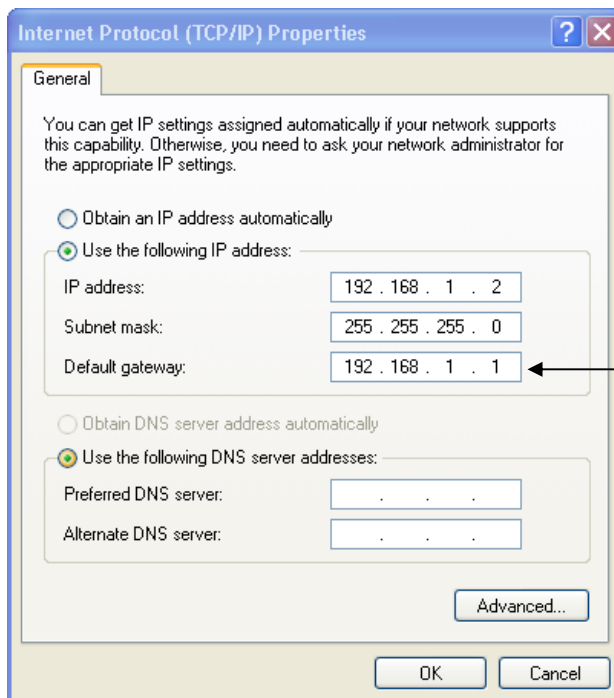
1. Install Apache Tomcat and the SRS server application as described on page 33
2. Install the SRS control interface (SRS-Ci) as described on page 26
3. Connect the laptop to the wireless router using a standard ethernet cable
4. The laptop has to be given a fixed IP on the router (not DHCP). To do this, click on **Start Button -> Control Panel -> Network and Internet Connections -> Network Connections** and right-click on **Local Area Connection** to get the menu below



5. In the dialogue box below, click on Internet Protocol (TCP/IP) and click **Properties**



6. The IP address you set on the laptop is arbitrary, but we recommend using the exact parameters specified below:



We're going to set up the router with this address in the next section

7. The laptop has now been given a fixed IP, and we're now going to configure the router so that the voting devices can connect to the same subnet as the SRS server

Setting up the wireless router

There are 3 settings which have to be set on the wireless router:

1. The IP address of the router itself - set this to **192.168.1.1**
2. The IP range for the DHCP server - this specifies which IP addresses are given to the voting devices. The range has to be adjusted according to the number of concurrent voting devices. For e.g. 30 units, the IP range could be **192.168.1.10-192.168.1.39**. Since the IP address of the server has been set to 192.168.1.2, the IPs of the voting devices should be set to 192.168.1.x (x being in the range 3-254).
3. The SSID ("name") of the wireless network to which the voting devices will connect. The SSID can be set to an arbitrary name

Configuring the voting devices to connect to the SRS server

The final step is to configure the voting devices to connect to the SRS server, using the closed, wireless network provided by the router. The procedure to do this is as follows:

1. Set up the device to connect to the wireless network that you set up on the router (select it in the list of available wireless networks)
2. Open up a web browser and enter the following URL on the voting device:
`http://192.168.1.2:8080/srs/student`
3. The following page should appear:



4. Follow the procedure on page 35 to check that the communication between the server and the voting devices is working

Appendix E: List of SRS server addresses and credentials

If you have installed the SRS control interface (SRS-Ci) (for setting up and running votes), the following server and credentials can be used for testing purposes:

The screenshot shows the SRS-Ci Login interface. It includes a title 'SRS-Ci Login', input fields for 'User name' (containing 'member') and 'Password' (containing '*****'), a 'Web server address' dropdown menu (showing 'Huddersfield 1'), and 'Login' and 'Exit' buttons. Below these are checkboxes for 'Advanced' (checked) and 'Use Localhost' (unchecked). A section for server details includes fields for 'Coordinating server', 'Service provider', 'Path', 'Version', and 'IP address', all containing specific URLs and version numbers. Annotations with arrows point to the username/password fields, the server dropdown, the Advanced checkbox, and the server details section.

SRS-Ci Login

User name:

Password:

Web server address:

http://edumecca.hud.ac.uk/srs

☒ Advanced ☐ Use Localhost

Coordinating server:

Service provider:

Path:

Version:

IP address:

User name: **member**
Password: **edumeccasrs**

Select **Huddersfield 1** from the drop-down list of servers

Ticking the **Advanced** checkbox displays the detailed settings for this particular server (it's **not** necessary to tick it in order to log on to the server)

Appendix F: Voting device URLs

The voting device always connects to the SRS server (i.e. NOT directly to the PC running the control interface (SRS-Ci), unless that PC is also used to run the SRS server, as described in

Appendix D: Setting up a stand-alone, portable SRS installation).

The generic form of the URL which is entered into the web browser of the voting device is

<http://some.server.address:8080/srs/student>

The :8080 parameter specifies that the device should connect to the server on port 8080. This is because the Apache Tomcat server uses port 8080 by default (other ports can be specified in the Tomcat configuration file - if port 80 is used, no port parameter is needed because http requests use port 80 by default).

If you're using the test server described in Appendix E: List of SRS server addresses and credentials, the URL to enter on the voting devices of the students and teacher, respectively, is

Students' voting devices

<http://edumecca.hud.ac.uk/srs/student>

Notice the absence of the :8080 parameter here (this server has been set up to use port 80).

Teacher's iPod

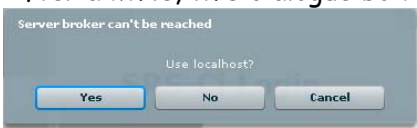
<http://edumecca.hud.ac.uk/srs/teacher>

This page is password-protected, and the credentials are as follows:

User name: **member**

Password: **edumeccasrs**

Appendix G: Troubleshooting

Problem	Solution
After double-clicking on the  icon on the desktop, the login screen appears, but the list of web servers is empty. After a while, this dialogue box pops up:  What should I do?	Just click on No and select the correct server from the drop-down list
Casting a vote on one voting device triggers a response on the other units (it's as if an "invisible hand" pushes the buttons on the other units)	Delete all the cookies on all the voting devices. If using an iPod Touch, this is done in Settings -> Safari and click on Clear Cookies
When clicking on the SRS icon on the iPod, I get the error message "Cannot Open Page"	You're not connected to the wireless network, or to the wrong network (the iPod may change from one network to the other as the respective signal strengths vary)
The vote is in progress, but the iPod still displays the "Please wait" page	Click on the  (refresh page) icon on the iPod to reload the page